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AIRBORNE ARMED FULL MOTION VIDEO: THE NEXUS OF OPS/INTEL INTEGRATION IN THE JOINT/COALITION ENVIRONMENT

by

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Operations and intelligence organizations continue to struggle with how to best plan and employ assets with a video capability. Many heated debates have occurred concerning manned and unmanned, as well as, armed and unarmed assets. This friction caused the less than optimum utilization of these assets. In today's Global War on Terrorism, timely, detailed intelligence is ever more critical to mission success. In many cases, operational commanders do not conduct their operations unless they are assured the availability of airborne full motion video (FMV) assets. The thesis of this paper argues the Department of Defense must adopt changes in joint doctrine, terms, organizations, and processes concerning armed, FMV capable platforms in order to employ FMV capabilities with greater operational effectiveness and efficiency.

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ABSTRACT

Operations and intelligence organizations continue to struggle with how to best plan and employ assets with a video capability. Many heated debates have occurred concerning manned and unmanned, as well as, armed and unarmed assets. This friction caused the less than optimum utilization of these assets. In today's Global War on Terrorism, timely, detailed intelligence is ever more critical to mission success. In many cases, operational commanders do not conduct their operations unless they are assured the availability of airborne full motion video (FMV) assets. The thesis of this paper argues the Department of Defense must adopt changes in joint doctrine, terms, organizations, and processes concerning armed, FMV capable platforms in order to employ FMV capabilities with greater operational effectiveness and efficiency.

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Chapter 1

Introduction

"Everything begins and ends with intelligence. Ops without intelligence is blind. Intelligence without ops is irrelevant."

- General Chuck Horner

The day is 7 October 2001. A Predator unmanned aerial system (UAS) and its crew are conducting the typical mission it has performed since coming onto the operational scene in the Balkans in the mid-1990s. The Predator team monitored a known Mullah Omar compound for enemy activity prior to an air assault on the compound. Several vehicles fled the compound under the watchful eye of the Predator. Subsequently, the vehicles and their passengers fled to another compound west of Kandahar. Then the crew made history. The mission commander was given the order by higher headquarters to engage the Taliban security forces' vehicle at the edge of the compound. This was the first shot in anger by a Predator and scored a direct hit. Most notably since that day in October, the growth of airborne full motion video (FMV) capabilities exploded. Between 1996 and 2004, the RQ-1 Predator UAS evolved into a formidable combat asset, involved in every major US military operation. During this period, USAF Predator aircraft logged over 100,000 flight hours, 68% of which were in combat. Now, the MQ-1 Predator, armed with the AGM-114 Hellfire missiles, continues to be one of the military's most

requested systems, supporting the Global War On Terror (GWOT) by finding, fixing, tracking, targeting, engaging, and assessing (F2T2EA) suspected terrorist locations.[1]

With this innovation, operations and intelligence organizations continue to struggle with how to best plan and employ assets with a video capability similar to that of the MQ-1 Predator. This struggle includes assets controlled by the air, land, and naval components. Many heated debates have occurred concerning manned and unmanned, as well as, armed and unarmed assets. This friction caused and still causes today the less than optimum utilization of these assets.

Thesis Statement

The thesis of this paper argues the Department of Defense must adopt changes in joint doctrine, terms, organizations, and processes concerning armed, FMV capable platforms in order to employ FMV capabilities with greater operational effectiveness and efficiency.

Relevance

In today's Global War on Terrorism, timely, detailed intelligence is ever more critical to mission success. In many cases, operational commanders do not conduct their operations unless they are assured the availability of airborne FMV assets. This fact has not gone unnoticed by the Joint Staff and United States Central Command (USCENTCOM). Both entities, as the primary military users of FMV assets, established Unmanned Aerial Vehicle Task Forces to tackle this problem. Unfortunately to date,

[1] United States Air Force, *The U.S. Air Force Remotely Piloted Aircraft and UAV Strategic Vision* (Washington DC: United States Air Force, 2005), 2.

given the limited scope of these task forces, they have had limited success in addressing the problem stated above.

Research Methodology

This research is a compilation of the history, strategic linkages, definitions, tasking process, and capabilities related to our nation's FMV capabilities. The chapter on history will summarize the use of FMV in past military operations to include operations prior to those conducted in the Balkans, Balkan operations to include Bosnia and Operation ALLIED FORCE (OAF), Operation ENDURING FREEDOM (OEF) major combat operations, Operation IRAQI FREEDOM (OIF) major combat operations, and OEF and OIF today. This chapter highlights and analyzes specific lessons learned from the use of FMV in each of these conflicts. The capabilities chapter summarizes and analyzes the capabilities and issues with several current and future FMV assets, both manned and unmanned, to include the AC-130 Spectre/Spooky, P-3AIP Orion, various targeting pod equipped fighter aircraft, MQ-1 Predator, RQ-5 Hunter, and MQ-9 Reaper.

The definitions chapter summarizes and analyzes applicable joint and service-specific definitions related to FMV. It includes an analysis of how various services define their current FMV capabilities/assets and the associated problems with their use of these terms. The tasking chapter summarizes and analyzes joint intelligence, surveillance, and reconnaissance (ISR) collection planning/execution doctrine and tactics, techniques, and procedures (TTPs), joint air operations planning/execution doctrine and TTPs, the difference in operations and intelligence airpower requirements management, and the impact of each of these on FMV planning at the strategic and operational level.

In order to conduct this research, a variety of information was collected. While much has been written on the subject of FMV capabilities, most of these writings concentrated on the operational use of manned aircraft conducting close air support or on the use of unmanned aerial vehicles for ISR missions. A large selection of joint publications, lesson learned documents, and articles exist related to this subject. The information gaps, especially related to recent operations, were filled through interviews with key personnel, both past and present, primarily from the Joint Staff, USCENTCOM, and Unites States Central Command Air Forces (USCENTAF) staffs. Therefore, the key to this research was the collation and subsequent analysis of this varied information to produce a holistic view of the problem.

Finally, several recommendations are provided which affect the planning and execution of airborne, armed FMV capabilities. If these recommendations are carried out, they have the potential to improve the effectiveness and efficiency of these FMV capabilities.

Scope

In order to narrow the scope of this research, several caveats must be made. First, what is FMV? To the technical purist, this has typically meant video at thirty frames per second or greater. For the purposes of this research, FMV will include any imagery capability which can produce imagery two frames per minute. Therefore, some of the innovative rapid revisit capabilities of the U-2 Dragonlady and RQ-4 Global Hawk will not be discussed.

Second, my analysis will concentrate on those systems that are planned and employed at the operational and strategic levels of warfare. Examples of these assets

include the MQ-1 Predator, RQ-5 Hunter, MQ-9 Reaper, AC-130 Spectre gunship, P-3 Orion, and several fighter aircraft equipped with targeting pods. Combatant commanders normally deem many, but not all, of these assets theater assets. Those not normally deemed theater assets are included because their capabilities can provide the same effects as theater assets, but service and/or component issues prevent their use as part of an integrated effort. This occurs because these systems are normally at the core of friction and heated debates.

Third, only systems which are currently armed or will be armed in the near future have been researched and analyzed. There are several manned and unmanned systems which are not armed that have similar FMV capabilities. While many of the recommendations for improvements apply to the unarmed platforms, these have been excluded to limit the scope of the paper. Additionally, the armed systems are normally at the heart of the often heated debates.

Fourth, when combatant commanders request these FMV assets, they want a combination of capabilities. Other capabilities, such as, signals intelligence, laser pointing and spotting, "ground forces rider,"[2] and specific weapons loads, are often in high demand. While these are important capabilities, typically the primary requirement is armed, FMV.

Though FMV capabilities have been utilized in multiple theaters, my analysis concentrates on the most recent use in the USCENTCOM area of operation. There are several major reasons for this decision. First, as mentioned earlier, with the widespread introduction of armed, FMV capabilities and the subsequent demand by headquarters and

[2] "Ground forces rider" refers to actually placing a liaison from the tactical ground force, such as a special forces team, onboard the FMV aircraft.

combat units, a perceived competition for these resources occurred between the operations and intelligence staffs at some locations. Many of these requirements remain unfulfilled, thus causing more friction. Second, most of the TTPs for the planning and execution of the capabilities were developed in OEF and OIF. These operations engendered the first real time downlink of video to forces in the field and not just command centers. Therefore, another venue for friction resulted between higher headquarters and subordinate echelons. Also, technological improvements and innovative TTPs facilitated the use of fighter aircraft equipped with targeting pods to meet some of the theaters' video requirements. Nonetheless, the use in other theaters, such as in Europe during OAF, will be covered to a limited extent in the history chapter.

There are several issues central to the planning and execution of airpower not included as part of this research and subsequent analysis. These include airspace management and deconfliction, frequency spectrum management, video product releasability and dissemination, and the tactical operations of the platforms. While these are critical issues, especially in regard to FMV capabilities, they are beyond the scope of this paper. Also, much debate currently centers on the "manned vs. unmanned argument," giving the impression we should only use one or the other and not both. Given some of the unique attributes of both manned and unmanned platforms and that there are more requirements than assets to meet operational needs, a basic assumption of this analysis is all assets made available to the FMV planners could be utilized to the maximum capability of the assets.

Due to the complex nature of many FMV platforms, their video architectures and the relatively short length of this paper, a basic knowledge of FMV concepts is assumed.

Some of these concepts are basic FMV knowledge, UAS command and control links, basic video dissemination methods, and fighter targeting pod use.

Finally, as this research was conducted and information was analyzed, it became apparent there are many bureaucratic issues related to FMV planning and execution. Some refer to these as operations and intelligence integration issues, stovepipes, or even "tribal wars." A stovepipe often refers to a specialized career field, traditionally one of the support functions, such as space, intelligence, surveillance, reconnaissance, and communications. Each career field has its own systems and methods of presenting data to commanders and operators. As an example, General John Jumper, USAF, has said the Air Force must remove the barriers between "tribal representatives" to get the "cursor over the target." [3] These types of issues exist between and within operations and intelligence, and both inter-service and intra-service. This can be a critical catalyst to the friction in FMV planning and execution. However, this topic area is a much larger issue than FMV and is thus, beyond the scope of this paper. Therefore, this paper seeks to objectively address critical issues related to FMV planning and execution, and then provide some recommendations for working through these issues.

[3] Adam Hebert, "Compressing the Kill Chain," *Air Force Magazine*, March 2003, 53-54.

Chapter 2

Historical Use of Full Motion Video

Just as television has become ingrained in American culture so has the use of video technology in military operations. This chapter will explore the use of video technology in recent military operations. Historically, details of airborne intelligence collection have rarely been declassified. Most unclassified historical documents concerning recent military operations only discuss ISR operations in the abstract and rarely discuss specific contributions of FMV assets. Therefore, this chapter will discuss the use of certain FMV capable platforms, such as UAS, in recent operations and not specifically FMV technology. Also, due to the relatively short length of this paper, this chapter is not an in-depth, exhaustive historical study, but focuses on specific combat examples of FMV use to demonstrate FMV's growth and importance to commanders. Therefore, short vignettes from magazines are used where limited details were found in official lessons learned documents. The capabilities of these specific platforms will be discussed in a subsequent chapter.

Before Bosnia

Over the past 50 years, the US military tested and employed numerous unmanned systems with varying degrees of success. The first operationally significant program was the Lightning Bug. This system, based on a target drone, was used for tactical

reconnaissance and flew almost 3,500 sorties during the Vietnam War. However, this system did not provide near-real time (NRT) video dissemination, nor was it armed.[4] In the early 1970s, the USAF conducted trials under the codename Have Lemon. These experiments explored the feasibility of using a Firebee surveillance drone in the Suppression of Enemy Air Defense mission. The resulting BQM-34A, equipped with a forward-looking TV camera, tail-mounted datalink pod and two wing-mounted pylons, successfully delivered AGM-65 Maverick missiles and other weapons against simulated air defense sites. It also released unguided bombs, rockets, and laser-guided bombs. However, the Vietnam War ended before the BQM-34A could be employed operationally, and the idea of using drones was shelved. In 1978, the last BQM-34A surveillance unit was withdrawn from service. They lost the post-Vietnam funding contest because they were seen as less applicable in a central European war and were not favored by the fighter pilot community.[5]

In the early 1980s, Israel successfully employed a number of UAS, such as the Mastiff and Scout. The watershed moment came during 1982 in the Bekaa Valley. In a carefully coordinated operation, Israeli forces used UAS to provide ISR and to activate Syrian air defense systems, allowing manned aircraft and missiles to destroy these air defenses.[6]

In addition during the 1980s, the USAF used the AC-130 in a number of different missions. Historically, the AC-130 gunship has a rich combat record dating back to

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[4] United States Air Force, *USAF RPA and UAV Strategic Vision*, 1.

[5] Roy Braybrook, "Drones With Muscle," *Armada International*, Jun/Jul 2004 [Journal on-line] available from http://proquest.umi.com/pqdweb?index=2&did=661314101&SrchMode=1&sid=1&Fmt=4&VInst=PROD&VType=PQD&RQT=309&VName=PQD&TS=1163272177&clientId=3921; Internet; accessed via ProQuest on 11 Nov 2006.

[6] United States Air Force, *USAF RPA and UAV Strategic Vision*, 2.

Vietnam. They destroyed thousands of trucks and were credited with many life-saving close air support missions. Similarly, AC-130s performed a variety of missions in 1983 for Operation URGENT FURY in Grenada, in 1989 for Operation JUST CAUSE in Panama, in 1990-91 for Operation DESERT STORM, and for Operations CONTINUE HOPE and UNITED SHIELD in Somalia.[7] While the AC-130 had some video capabilities, the video was not disseminated in NRT and was only used in support of the direct employment of the AC-130's organic weapons.

Operations in Bosnia

After the Bekaa Valley campaign, the US purchased the Pioneer UAS and developed new systems, such as the RQ-1 Predator.[8] In the 1990s, the US used these FMV systems in Bosnia in support of a variety of operations, such as Operation JOINT FORGE. These operations marked the explosive expansion of FMV use.[9]

Predator and other UAS were surveillance platforms that could monitor a situation for unprecedented period of time. The Predator was often used against point targets even though it was best designed for active surveillance. Multi-National Division (North) leaders viewed the Predator as one of the most successful intelligence capabilities. They used it successfully to provide coverage of lines of communication, rallies, demonstrations, and combat operations.[10] Every Predator mission included the ability to

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[7] United States Air Force, *U.S. Air Force Fact Sheet AC-130H/U Gunship* (Washington DC: United States Air Force, Oct 2005) [On-line]; available from http://www.af.mil/factsheets/ factsheet.asp?fsID=71; Internet; accessed 10 Nov 2006.

[8] United States Air Force, *USAF RPA and UAV Strategic Vision*, 2.

[9] Larry Wentz, *Lessons From Bosnia: The IFOR Experience* (Washington DC: Department of Defense, 1997), 22-24.

[10] Ibid., 103.

do some dynamic re-tasking, making them more flexible and responsive to the commander.[11]

Starting in May 1996, Airmen disseminated the Predator video to several Bosnia command and control nodes over the Joint Broadcast System (JBS). However, JBS could not be used to disseminate P-3 Orion, Air Reconnaissance Low (ARL), or Lofty View video because these platforms only had line of sight (LOS) downlinks.

Beginning in June 1996, the Pioneer UAS provided FMV at division and brigade task force levels during peacekeeping operations. These platforms demonstrated the ability to quickly satisfy information requirements and be dynamically re-tasked at the tactical level. Nevertheless, Pioneer's performance was often disastrous with five crashes due to engine, generator, rocket-assisted launcher, or on-board computer failures. Precipitation, clouds, LOS problems, and an outmoded imagery dissemination system imposed other constraints. Maintenance was also a problem with a field-level perception that it was down more than it was up.[12]

Several other systems provided support. The US Navy P-3C Orion with its video datalink system monitored incidents in the Bosnia area as did another short-range theater-level UAS, the Lofty View.[13] ARL was a reconnaissance platform that could downlink its video in NRT and was a workhorse for Task Force Eagle.[14] However, the ARL downlink station did not always receive the video or selected images on the same day of the mission. Sometimes it took two to three days to get the complete ARL video to Task

[11] Ibid., 99.
[12] Ibid., 104.
[13] Ibid., 102.
[14] Ibid., 106.

Force Eagle.[15] Additionally, AC-130s played a pivotal role in supporting the NATO mission by providing air support for US and allied ground forces.[16] However, its video was still limited to onboard use by the platforms crew.

The UAS contributed significant advantages over manned platforms; they did not put personnel at risk, they provided reduced detection by enemy forces, and they supplied a broad range of collection capabilities (signals intelligence, electronic intelligence, imagery intelligence, and NRT FMV).[17] The greatest UAS limitation was its lack of flexibility. The various UAS either needed to be pre-programmed or controlled by personnel within LOS. Like their manned counterparts, unmanned systems were susceptible to reduced capability during adverse weather.[18]

While Balkan operations brought about the first widespread use of FMV, the scarcity of resources and processes limited their utility. The competition to satisfy both theater and tactical requirements with scarce theater collection assets meant tactical commanders came to rely on those sources best responding to their needs. Those personnel conducting overall video collection management, archiving, and dissemination lacked the required doctrine and Concept of Operations (CONOPS) to guide them.[19] The Combined Air Operations Center (CAOC) control of the theater platforms frustrated the tactical commanders and in their view, limited the tactical flexibility of UAS.[20] Most NRT surveillance assets were downlinked to an operations center and someone there would relay by voice what they saw in the video.[21]

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[15] Ibid., 108.
[16] United States Air Force, *U.S. Air Force Fact Sheet AC-130H/U Gunship.*
[17] Larry Wentz, *Lessons From Bosnia: The IFOR Experience*, 69-70.
[18] Ibid., 68.
[19] Ibid., 107.
[20] Ibid., 115-116.
[21] Ibid., 98.

Operation ALLIED FORCE (OAF)

On 20 March 1999, the Kosovo Verification Mission withdrew from Kosovo and on 23 March 1999, the order was given to commence OAF. From 24 March through 9 June 1999, North Atlantic Treaty Organization (NATO) flew more than 38,000 sorties prosecuting the air war over Serbia with the loss of only two manned aircraft and no causalities as a result of enemy action. Brigadier General Charlie Croom, European Command (EUCOM) J6, referred to OAF as "the Age of the Video War" with the introduction of NRT UAS and P-3 video dissemination.[22]

Commanders used UAS, such as Hunter and Predator extensively. JBS was used to disseminate UAS video as well as other imagery and information. ARL was not used.[23] The US Army's Hunter UAS was a true workhorse and a valuable asset to the operation. The US Army used it everyday, weather permitting.[24] The Hunter helped meet surveillance needs and provided the commander some added operational flexibility to accommodate rapidly changing needs.[25]

Both the US and Dutch used P-3s. Force protection concerns, however, required the P-3s to fly at higher altitudes than normal. This affected video quality and ultimately usefulness to the ground component commander. Additionally, the initial use of the Dutch P-3 uncovered an interoperability problem caused by the use of different standards for video.[26]

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[22] Larry Wentz, *Lessons From Kosovo: The KFOR Experience* (Washington DC: Department of Defense, 2002), xix.
[23] Ibid., 454.
[24] Ibid., 457.
[25] Ibid., 458.
[26] Ibid., 459.

The Joint Forces Air Component Commander (JFACC) became very inventive and put a tremendous effort into attacking the fielded forces in Kosovo. A combination of flying airborne forward air controllers primarily in A-10, F-14, and F-16 aircraft, UAS and a variety of other sensor capabilities were all focused on finding and fixing mobile military targets for attack. Without friendly ground forces, the JFACC had to rely on cross-cueing a variety of sensor inputs, like Joint Surveillance Target Attack Radar System, UAS video, satellites with high altitude imagery, and human intelligence to find and fix enemy fielded forces.[27]

The US, British, French, and German UAS capabilities were not shared nor were they leveraged in combined operations to fill gaps in operational needs. Some UAS video was shared, but not in real-time or as a combined operation.[28]

The new global awareness achieved through NRT dissemination of information over the vast worldwide television networks and the internet placed increased demands on the OAF military commanders to share more timely information not only among the coalition forces but with political leaders, the media, and the population in general. The demands for information during OAF stressed the NATO and Allied information networks to their limits.[29]

Operation Enduring Freedom (OEF) Major Combat Operations

OEF marked the first time the US military responded to an act of terrorism with a large-scale, sustained, conventional-force operation. The war on al Qaeda and the Taliban was most intense from October 2001 through January 2002, when it featured

[27] Ibid., 111.
[28] Ibid., 465.
[29] Ibid., xx.

mostly airpower and special operations forces. It was not a massive air war as the sortie count from its start through the ground forces takeover of major Afghan cities was about half that of OAF in 1999 and nowhere near that of DESERT STORM in 1991. Approximately 80 percent of the targets struck by US airpower were time-sensitive targets. Originally called "flex targeting" during OAF in 1999, the process was renamed "time-critical targeting." It could be used for attacking any mobile or high value target, especially those identified through electronic emissions, communications, or other intelligence, giving only brief indications of target's location. As emerging targets came to dominate tasking, the key was to strikers on station over Afghanistan long enough to get valid targets for their weapons.

While US Air Force bombers and Navy fighters adapted to this new way of war, another highly unusual type of air war was occurring. This covert air war used UAS, satellites, and other intelligence sources to track time-critical targets, of which the most critical were the al Qaeda and Taliban leaders on the OEF most-wanted list. In 2001, the most time-critical targets of all were people such as Osama bin Ladin and Mullah Muhammad Omar, the Taliban's principal spiritual leader.

President Bush summed up the meaning of this new way of war in his 11 December 2001 Citadel speech. "These past two months have shown that an innovative doctrine and high-tech weaponry can shape and then dominate an unconventional conflict," he said, noting that "this combination--real-time intelligence, local allied forces, special forces, and precision airpower--has really never been used before."[30]

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[30] Rebecca Grant, "An Air War Like No Other," *Air Force Magazine*, Nov 2002 [Magazine on-line]; available from http://www.afa.org/magazine/Nov2002/ 1102airwar.html; Internet; accessed on 11 Nov 2006, 1-10.

While much has been documented about the Predator and AC-130 in OEF, other platforms played just as critical a role. Within days of the 11 September 2001 terrorist attacks, P-3s already in the Gulf region began surveillance missions to provide operational commanders with a clearer picture of enemy within Afghanistan. This support was a key to the success of the first strikes launched by the United States and its allies on 7 October 2001. Navy P-3s also participated in the initial night attacks, firing AGM-84H Stand-off Land Attack Missiles-Extended Range (SLAM-ER) against Taliban and al Qaeda targets.

On 17 October 2001, Navy P-3s began surveillance flights to give ground commanders an around-the-clock view of US Special Forces ground operations. In the battle for Tora Bora, the Navy's P-3s provided real-time reconnaissance of cave complexes where al Qaeda and Taliban fighters were hiding. The P-3s transmitted NRT FMV to operational commanders coordinating US Air Force B-52 and fighter aircraft strikes on the caves in the rugged mountains. Simultaneously, they also flew ISR missions in other regions of Afghanistan in an effort to locate senior al Qaeda members seeking to escape over the border into Pakistan.

Even as P-3s were providing support to overland operations in Afghanistan, they continued to support coalition maritime interdiction operations and carrier battle group protection at sea. The interdiction mission tasked the P-3 with the surveillance of millions of square miles of ocean to detect, investigate, and target suspicious merchant vessels.[31]

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[31] David Reade, "P-3s Remain Frontline Combatants," *United States Naval Institute. Proceedings*, Sep 2003 [Journal on-line]; available from http://proquest.umi.com/pqdweb?index=0&did=422695081&SrchMode=1&sid=1&Fmt=3&VInst=PROD&VType=PQD&RQT=309&VName=PQD&TS=1163270063&clientId=3921; Internet; accessed via Pro Quest on 11 Nov 2006, 36.

Operation IRAQI FREEDOM (OIF) Major Combat Operations

In 2003, extensive use of FMV assets continued during the major combat operations in OIF. The MQ-1 Predator was tasked to strike mobile satellite uplink transmitters in Baghdad used by the regime to maintain its state-run television broadcast. The Predator and Hellfire combination provided the ability to precisely employ a low yield weapon against a strategic urban target with low collateral damage potential.[32]

P-3s were tasked with battle-group protection missions and pre-conflict maritime ISR. They located and tracked hundreds of vessels suspected of smuggling or laying sea mines in the Arabian Gulf. They provided NRT video imagery of the area in and along the coast of Iraq and up the inland waterways, gathering intelligence on Iraqi troop positions, military installations, and surface-to-surface missile sites.

Just as they did in OEF, P-3s provided US Marines with NRT ISR. As the US Marines advanced, the P-3s reported on Iraqi forces dispositions and provided targeting information the Marines used to attack targets with missiles and strike aircraft. P-3s located key bridges, which the US Marines captured before they could be destroyed, and Iraqi armor and vehicles. The P-3s also reconnoitered military bases and airfields in the vicinity of Baghdad.

The P-3 initially provided reconnaissance of the oil facilities and platforms and then transmitted real-time surveillance video of the Special Forces operations carried out by US Navy Sea, Air Land (SEAL) teams and British Royal Marines back to operational commanders in their headquarters. Simultaneously, further inland, another Navy P-3

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[32] Air Land Sea Application Center, *Multi-service Tactics, Techniques, and Procedures For Aviation Urban Operations* (Langley AFB, VA: Air Land Sea Application Center, Jul 2005) II-13-15.

supported other US special forces and Marine elements in an operation to secure the Rameilah oil fields in southern Iraq.

Australia made a significant contribution to Operation Iraqi Freedom. Among the ships, aircraft, and troops sent to support operations in Iraq were two Royal Australian Air Force (RAAF) P-3Cs. These RAAF P-3s distinguished themselves by providing situational awareness and vital information on Iraqi operations on the battlefield to coalition air, ground, and naval forces. Like their US counterparts, the Australian P-3s also monitored and targeted numerous Iraqi patrol boats and small dhows fishing and merchant vessels that choked the inland waterway.[33]

OEF/OIF Today

After major combat operations in both OIF and OEF, a number of non-lethal airpower innovations proved far more prevalent than lethal fires and represented the ingenuity and drive of the coalition military commanders and their staffs. Fighter aircraft conducted infrastructure-security missions, simultaneously fulfilling the multi-national force commander's strategic priority of protecting Iraq's lifeblood—oil and electrical systems—from insurgent attacks and the Combined Forces Air Component Commander's (CFACC) direction not to waste fuel, time, or effort in airborne-alert orbits around the country. On a smaller scale, fighter crews conducted non-traditional intelligence, surveillance, and reconnaissance (NTISR) missions on behalf of ground commanders.

As Col Michael Formica, US Army, commander of Black Jack Brigade, explained:

[33] David Reade, "P-3s Remain Frontline Combatants," 36.

> In my first few months in country, I rarely put air into my plan—this was because we did not understand how it could assist us in a counterinsurgency fight—then I saw the incredible results in Fallujah and in our follow-on operations. After that, in our North Babil operations and election prep, I never left without my JTAC and always requested air to support our operations.[34]

Strike sorties, normally a 12-1 ratio over ISR sorties, were flown at a ratio of 2-to-1 in Fallujah, highlighting the new importance of ISR.[35]

The toll on these high density, low demand assets is felt, but the squadrons keep breaking flying hour records. From June 2004 to June 2005 the MQ-1 Predator flew more than 27,000 hours in OIF/OEF, breaking its own monthly record three of the previous 12 months. Comparatively, the unit flew nearly 20,000 hours in 2004 and 9,500 in 2003. After 2001 when the US Air Force equipped the MQ-1 Predator with the AGM-114 Hellfire missiles, ground commanders could not get enough FMV air support. According to Lieutenant Colonel Bannon, an MQ-1 Predator squadron operations officer:

> The Army and Marines have an insatiable appetite for full-motion video the Predator supplies. There is a daily request for more than 300 hours of video a day and we can only provide about 110 hours. That's a big shortfall.[36]

US Air Force fighter aircraft in OIF and OEF are providing powerful support to US ground forces, responding as they always have done with on-call air support when in a troops in contact situation. Increasingly this support features not just precision attack but delivery of FMV on demand. Various targeting pods, originally developed to enhance bombing accuracy, have been pressed into service as part of the ISR network. These

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[34] Howard Belote, "Counterinsurgency Airpower Air-Ground Integration for the Long War," *Air and Space Power Journal*, Fall 2006, 55-64.

[35] Brian Newberry, "The Air Force in the Urban Fight," *Armed Forces Journal*, 28 Sep 2006, 29.

[36] Orville Desjarlais, "Predator Flies Unprecedented Combat Flight Hours," *Air Force Print News*, 13 Sep 2005[On-line]; available from http://www.af.mil/news/story_print.asp?storyID=123011764; Internet; accessed on 11 Nov 2006, 1.

airborne sensors help generate instant situation updates to ground forces engaged in combat operations. This new technique has vastly improved the ability to find, fix, and engage the enemy. Also, this capability of non-traditional ISR (NTISR) has vastly sped up the battle damage assessment (BDA) process. When needed, they can use their targeting pods to zoom in on a target and put ordnance on target. [37]

In short, the targeting pods have integrated the fighter aircraft even more fully into the ground fight and now into the ISR fight. Lieutenant General Walter E. Buchanan III, Commander, US Central Command Air Forces (CENTAF) noted:

> Initially, there was tremendous pushback from fighter pilots who resisted the notion of becoming manned Predators. However, it was the right thing to do, and it demonstrated a real-time way to leverage a system in theater, which could also pick up valuable video intel.[38]

While NTISR missions are performed almost daily in today's OEF and OIF operations, many fighter pilots continue to resist performing these missions.

Brigadier General William Rew, CENTAF Director of Operations proposed using F-16 aircraft with a Litening pod in lieu of U-2 reconnaissance aircraft to service lower priority targets in southern Iraq. On ingress to their assigned kill boxes in Iraq, fighter pilots were ordered to fly over the "crown jewels" of Iraqi infrastructure, the pipelines, railroads, power lines, and the main roads leading out of Baghdad. While this targeting pod imagery was "quite a bit fuzzy" compared with that obtained from the U-2, "it was good enough to show them what they wanted to see." [39] Using this capability freed up other ISR assets for higher-priority missions.

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[37] John Tirpak, "Eyes of the Fighter," *Air Force Magazine*, Jan 2006, 40-44.
[38] Ibid.
[39] Ibid.

In 2004, Lieutenant General Buchanan pressed the US Air Force to also equip A-10 aircraft with targeting pods. This is where NTISR begins to take another step in the evolution of FMV. Up until that point, the targeting pods had filled a tactical ISR gap, but now with new radios and the FMV from the targeting pods, A-10 pilots could begin a new level of coordination with the ground forces.[40]

At first, A-10 units balked at taking up the ISR mission. Pilots worried the A-10 would be turned into a manned MQ-1 Predator. However, Lieutenant General Buchanan said, "I'm glad we did it, because we saved more than one person's life." According to Major General Norman Seip, assistant deputy chief of staff for air and space operations, fighters with targeting pods often are used as a kind of backup ground force. These aircraft with their targeting pods can respond immediately if the ground force has an emergency or can "watch the back door of a building" as a coalition force approaches during a routine operation. Major General Seip added, "Not only are you an ISR platform, but you're a little bit of a command and control network up there. You can assist the ground forces in keeping track of what's going on."[41] The use of targeting pods is not an all-US Air Force affair. Marine and Navy fighters, primarily using the Litening system, also have the ability to link up with ground forces and use their pods for FMV support. [42]

Coordinating the use of fighter targeting pods in the CAOC and putting the NTISR on the Air Tasking Order (ATO) means the MQ-1 Predator, the "preferred" provider of

[40] Ibid.
[41] Ibid.
[42] Ibid.

FMV to ground forces, can be apportioned to where their persistence can be used to maximum effect. Major General Seip noted:

> It's all part of a layered approach to persistence. CAOC coordination is essential, because it will sometimes divert a fighter to an area of interest for surveillance, but must first make sure it is not being pulled away from a higher-priority mission. The dynamic retasking of fighters for both NTISR and weapons functions is "an art and a science. The moons aligned correctly, in that you had counterinsurgency warfare, you had the technology evolving, you had the fact that we as an Air Force are very much a supporting component to the ground commander. In a medium- or high-intensity conflict, however, the emphasis would be to revert to using combat aircraft for mostly attack and kinetic combat, not NTISR.[43]

The evolution of fighter NTISR is a product of the unique nature of OIF and OEF and may not be a blueprint for future wars. Nevertheless, the rapid pace of NTISR development and adapting it to fill an important role in the fight is "a testament to the flexibility of airpower."[44] As highlighted in this chapter, FMV utilization has significantly increased. From its relative infancy prior to Bosnia to its prominent role in the OIF, OEF and the GWOT, FMV has proven to be one of the most vital tools to the combat commanders. This is especially true since the introduction of near-real-time dissemination directly to tactical ground units. One could wonder how we accomplished Operation OVERLORD during World War II without FMV. FMV platforms and their specific FMV capabilities are explored in the next chapter.

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[43] Ibid.
[44] Ibid.

Chapter 3

Full Motion Video Assets

During the operations outlined in the previous chapter, a wide variety of air assets, both manned and unmanned, provided FMV capability to the combatant commanders. This chapter highlights some of the characteristics of a sampling of these assets. This is not meant to be a detailed technical report, but a broad overview of the capabilities provided to the joint force commander. Also, particular attention is given to the mission of the platform as stated by the service. This provides the foundation for the analytic framework for improving the joint planning and employment of these assets. This chapter also highlights some of the important contributions fighter aircraft are making in filling FMV coverage gaps. However, current Air Force documents, such as *The Air Force Handbook* and *Air Force Fact Sheets* do not mention targeting pods, ISR, or FMV with respect to these platforms. This is a subtle hint on how little the Air Force really focuses on this capability.

Remote Operations Video Enhanced Receiver (ROVER)

First used in OEF, ROVER provided the first widespread dissemination capability for FMV beyond headquarters locations to fielded forces. ROVER allows Joint Terminal Attack Controllers (JTAC) with special laptop computers to receive video imagery from Predator, C-130s equipped with the Scathe View imaging system, or fighters carrying

Litening or Sniper targeting pods. Rapid access to this FMV "allows ground commanders to see and react to targets on the battlefield with a level of speed and accuracy unheard of five years ago," USAF officials wrote in an information paper. "He can now watch their movement real time, positively ID them, and bring weapons to bear or direct ground forces to engage."[45]

The MQ-1 Predator's "sensor" and "shooter" ability has made it the most requested asset in Southwest Asia. But the demand for this FMV capability has become limitless. In many cases, FMV may be overkill.

> With limited bandwidth available, do you even need 30 frames per second? A convenience store surveillance system, just like a fighter equipped with an advanced targeting pod, has nowhere near that level of quality, yet still may provide the desired effect. One frame-per-minute video would be good enough for some applications. This is intelligence operations. The challenges are in persistence and speed. If it takes 10 minutes to dig a ditch to put a bomb in, then I want to look at that road every five minutes.[46]

Then, the intelligence collected needs to be relayed to those who can take action against the target. ROVER, with its ability to interface with multiple sensor platforms, provides this flexible, NRT dissemination capability.

MQ-1 Predator

The MQ-1 Predator is the premier medium-altitude, long-endurance UAS. According to the 2006 *Air Force Handbook*:

> The MQ-1's primary mission is long-dwell reconnaissance and target acquisition in support of the Joint Forces commander. It also provides dedicated support to ground troops by directly down-linking real-time FMV to units equipped with ROVER terminals. The MQ-1 Predator has the capability to directly attack critical, perishable targets with AGM-114

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[45] Adam Hebert, "Army Change, Air Force Change," *Air Force Magazine*, Mar 2006, 39.
[46] Ibid., 41.

> Hellfire missiles. The MQ-1 Predator is a UAS that delivers persistent ISR with day/night full-motion video, laser target designation for fellow aircraft, and direct-strike capabilities.[47]

The MQ-1 carries the Multi-spectral Targeting System (MTS) with its inherent AGM-114 Hellfire missile targeting capability and integrates electro-optical, infrared, laser designator and laser illuminator capabilities into a single sensor turret. The aircraft can employ two laser-guided Hellfire anti-tank missiles. According to the USAF MQ-1 Fact Sheet, the MQ-1's primary function is armed reconnaissance, airborne surveillance and target acquisition.[48]

According to *Field Manual 3-06.1, MTTP for Aviation Urban Operations*:

> The MQ-1 Predator is a medium-altitude, long-endurance, remotely piloted aircraft. The MQ-1's primary mission is interdiction and conducting armed reconnaissance against critical, perishable targets. When the MQ-1 is not actively pursuing its primary mission, it acts as the JFACC-owned theater asset for reconnaissance, surveillance and target acquisition in support of the Joint Forces commander.[49]

The mission definition variances among the documents cited above and others are a major point of friction in joint operations. A more in-depth discussion of this topic and its impact is covered in Chapter 5.

Some attack aircraft, notably the AC-130, have been equipped to receive MQ-1 video via ROVER, allowing the assets to operate as virtual hunter-killer teams. The combination of robust target detection and identification sensors, the ability to pass that information to other strike aircraft, the ability to assist in target prosecution by laser

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[47] United States Air Force, *The Air Force Handbook 2006* (Washington DC: United States Air Force, 2006), 188.

[48] United States Air Force, *U.S. Air Force Fact Sheet MQ-1 Predator Unmanned Aerial Vehicle* (Washington DC: United States Air Force, Oct 2005), [On-line]; available from http://www.af.mil/factsheets/factsheet_print.asp?fsID=122&page=1; Internet; accessed 10 Nov 2006.

[49] Air Land Sea Application Center, *MTTP For Aviation Urban Operations*, II-13-15.

designation, and NRT dissemination of sensor data for combat assessment has effectively allowed the aircraft to perform as a persistent targeting pod. Long loiter and slow speeds permit methodical sensor scans of complex urban operating environments. The ROVER capability to transmit sensor video directly to ground forces, including JTACs, proved immensely effective during OIF/OEF operations. Many ground commanders preferred Predator over other CAS assets because of its ROVER capability, persistence, and low collateral damage weapons.[50]

RQ-5 Hunter

The RQ-5 Hunter is a smaller UAS than the MQ-1, normally flies lower, with a shorter range, and for a shorter duration. While on station, the RQ-5 operators can get direction from several higher headquarters elements. If definitive command and control arrangements are not in place, this can cause critical delays in target prosecution.

The Hunter operates in much the same way as Predator. However, Hunter must remain within LOS to its ground station due to communication limitations. This prevents the system from ranging the theater and dedicates it to certain operating areas, such as Baghdad in OIF operations. The RQ-5 Hunter UAS are being upgraded with the Viper Strike weapon system giving it a limited organic kinetic strike capability.[51]

[50] Ibid., II-13-15.
[51] Ibid.

MQ-9 Reaper

The MQ-9 Reaper will provide battlefield situational awareness and immediate precision strike capability. The MQ-9 Reaper will provide continuous coverage of the area of operations, independent of time of day or weather obscuration, with the ability to detect, identify, attack, and destroy critical emerging targets (both moving and stationary) from medium altitude within the defined area. The MQ-9 provides persistent FMV directly to commanders and their fielded forces. The MQ-9 can conduct direct strikes using Guided Bomb Unit (GBU)-12 laser-guided 500-lb. bombs, the 500 pound GBU-38 Joint Direct Attack Munition (JDAM), and laser target designation for buddy aircraft. Also, the MQ-9 provides persistent ISR with day/night full-motion video (EO/IR) and a synthetic aperture radar with Ground Moving Target Indicator (GMTI).[52]

AC-130H Spectre/AC-130U Spooky

The AC-130 gunship provides close air support, air interdiction, and armed reconnaissance. Other missions include perimeter and point defense; escort; landing; drop and extraction zone support; forward air control; limited command and control; and combat search and rescue. It incorporates side-firing weapons integrated with sophisticated sensor, navigation, and fire control systems to provide surgical firepower during extended loiters, at night and in adverse weather.[53]

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[52] United States Air Force, *The Air Force Handbook 2006*, 190.
[53] Ibid., 34.

The AC-130 is uniquely capable to support missions in an urban environment due to its accuracy, low yield munitions, and extended loiter time. Situational awareness is enhanced by the ability to keep "eyes on" the target throughout its orbit of the target with its electro-optical and infrared systems.[54] Within permissive environments, the AC-130 is effective in CAS, interdiction, armed reconnaissance, point defense, escort, surveillance, security support, limited airborne command and control, and search and rescue support.[55]

P-3 Orion

The P-3 Orion has been the backbone of the US Navy's maritime ISR capability for over 45 years. With its wide array of sensors, long mission endurance, and ability to carry weapons, the P-3 provides unique capabilities to the joint commander. For the US Navy's maritime patrol community, the "quiet" days of hunting Soviet submarines are gone. Over the past several years, however, P-3 Orion have become indispensable parts of the GWOT and US military operations on land as well as at sea. From flying missions in Operation Iraqi Freedom to nighttime surveillance over Afghanistan, P-3s demonstrated they remain frontline combatants.

The P-3 has impressed operational commanders since the conflict in the Balkans. The aircraft has emerged from the antiterrorist operations in Afghanistan and the overthrow of Saddam Hussein's regime in Iraq as an indispensable ISR asset.[56]

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[54] Land Sea Application Center, *MTTP For Aviation Urban Operations*, II-11-12.
[55] Ibid., III-12.
[56] David Reade, "P-3s Remain Frontline Combatants," 36.

RC-26B

The RC-26B flown by the Air National Guard provides a highly mobile ISR platform for use in counterdrug and counter-narcoterrorism operations. It regularly provides mission support for Southern Command (SOUTHCOM), Northern Command (NORTHCOM), the Department of Homeland Security, and the United States Secret Service supporting national special security events, crisis/disaster response, maritime patrol, homeland defense, and the GWOT. The system consists of electro-optical and Forward Looking Infrared (FLIR) sensors for video recording and two still cameras (digital and wet film). The aircraft is operated by two pilots and a mission system operator. Typically, there is a law enforcement official or other agency representative on the aircraft to direct the operation, and ensure mission requirements are met.[57]

C-130H Scathe View

The mission of the C-130H Scathe View system is to provide unobtrusive, long-range, and long-loiter ISR collection capability in a permissive environment. The US Air Force developed Scathe View to support short-duration, non-combatant evacuation and humanitarian relief operations in a permissive or semi-permissive environment. It provides imagery and video similar to the MQ-1 Predator directly to ground personnel. Scathe View consists of a roll-on/roll off sensor pallet carried by specially modified C-130H aircraft. Employed with ROVER, it provides still-frame and FMV imagery downlink to ground units. This provides added situational awareness and valuable

[57] United States Air Force, *The Air Force Handbook 2006*, 204.

support to combat operations in a GWOT environment, including force protection during counterinsurgency operations.[58]

A-10/OA-10 Thunderbolt II

The A-10 provides CAS and Forward Air Control (FAC) support to the ground commander including Special Forces. In addition, the A-10 performs interdiction under certain circumstances.[59] Using night vision goggles, A-10 pilots can conduct effective night operations. The Thunderbolt II can be serviced and operated from bases with limited facilities near the battle.[60] As stated in the opening paragraph of this chapter, nowhere in *The Air Force Handbook* or *Air Force Fact Sheets* regarding the A-10 is there a mention of FMV, NTISR, or targeting pod capabilities.

F-16 Fighting Falcon

The F-16 Fighting Falcon is a compact, multi-role fighter aircraft. It is highly maneuverable and has proven itself in air-to-air and air-to-ground combat operations. It provides a relatively low-cost, high-performance weapon system for the US and allied nations.[61] While the F-16 and its targeting pod has been used with success in OIF and OEF, nowhere in *The Air Force Handbook* or *Air Force Fact Sheets* regarding the F-16 is there a mention of FMV, NTISR, or targeting pod capabilities.

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[58] Ibid., 94.

[59] Ibid., 30.

[60] United States Air Force, *U.S. Air Force Fact Sheet A-10/OA-10 Thunderbolt II* (Washington DC: United States Air Force, Sep 2006), [On-line]; available from http://www.af.mil/factsheets/factsheet.asp?fsID=71; Internet; accessed 10 Nov 2006.

[61] United States Air Force, *U.S. Air Force Fact Sheet F-16 Fighting Falcon* (Washington DC: United States Air Force, Jun 2006), [On-line]; available from http://www.af.mil/factsheets/factsheet.asp?fsID=103; Internet; accessed 10 Nov 2006.

F-16 Theater Airborne Reconnaissance System (TARS)

The F-16, when outfitted with the TARS pod, provides penetrating tactical reconnaissance that gathers timely, high-quality imagery for use by commanders in the field. The F-16 TARS consists of a removable pod uploaded to some F-16 aircraft. TARS is the Air Force's only high-speed, penetrating, under-the-weather reconnaissance capability. However, due to the size of the pod, operational limitations hinder its ability to support both ISR and CAS requirements. Continuously deployed in Iraq since May 2005, TARS has significantly increased imagery available in OIF by producing over 4,000 images for USCENTCOM in support of counterinsurgency pre-raid planning, Improvised Explosive Device (IED) detection for convoy support, time-sensitive targeting and BDA.[62]

F-15E Strike Eagle

The F-15E Strike Eagle is a dual-role fighter designed to perform air-to-air and air-to-ground missions. The F-15E's wide array of avionics and electronics systems gives it capability to fight at low altitude, day or night, and in all weather. It can fight its way to a target over long ranges, destroy enemy forces and fight its way out. Its targeting pod, such as the Low Altitude Navigation and Targeting Infrared for Night (LANTIRN) or Sniper Advance Targeting Pod, allows the aircraft to fly at low altitudes, at night and in any weather conditions, to attack targets with a variety of precision-guided and unguided weapons. The targeting pod contains a laser designator and a tracking system to mark targets for destruction at long ranges. Once tracking has been initiated, the aircraft

[62] United States Air Force, *The Air Force Handbook 2006*, 140.

automatically hands off targeting information to GPS or laser-guided bombs.[63] Just as was stated regarding the A-10 and F-16, nowhere in *The Air Force Handbook* or *Air Force Fact Sheets* regarding the F-15E is there a mention of FMV, NTISR, or targeting pod capabilities.

F/A-18 Super Hornet

The F/A-18F Super Hornet is equipped with the Advanced Tactical Forward-Looking Infrared (ATFLIR) pod. This pod is equipped with long-range, high-resolution electro-optical and infrared sensors, as well as a laser target designator. It can also transmit target imagery from the sensor to ground commanders via its Link 16 datalink. The Super Hornet is can also be equipped with the Shared Reconnaissance Pod equipped to provide electro-optical and infrared imagery in NRT via data link.[64]

As summarized above, the joint commander has a wide variety of FMV platforms. The Air Force is developing more targeting pod capable aircraft, such as the B-1 and B-52 bombers, which potentially provide a longer loiter capability. The F-22 and F-35 FMV capability is yet to be determined. This continued growth will only increase the abundance and variety of available FMV assets once reserved for large ground formations.[65] "With the reconnaissance pod, we're now data-linking over a thousand images down to the Army's exploitation ground station that's in one of Saddam's

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[63] United States Air Force, *U.S. Air Force Fact Sheet F-15E Strike Eagle* (Washington DC: United States Air Force, Jun 2006), [On-line]; available from http://www.af.mil/factsheets/ factsheet.asp?fsID=71; Internet; accessed 10 Nov 2006.

[64] Richard Burgess, "Dual Role Strike Fighters Bring Their Own Surveillance to the Battle," *Sea Power Magazine*, May 2006 [On-line]; available from http://www. navyleague.org/sea_power/may06-18.php; Internet; accessed 10 Nov 2006.

[65] Adam Hebert, "Army Change, Air Force Change," 37.

palaces," Capt. "BD" Gaddis, the Navy's program manager for the Super Hornet said.[66] Also, a recent RAND report stated, "new found Army confidence in the accuracy and responsiveness of air-delivered fires will result in increased Army requests for CAS and air interdiction."[67] Finally, the rapid fielding of UAS has resulted in dramatic new capabilities suited for urban operations. Operational UAS have matured to multirole platforms capable of providing persistent discriminating stare and precise lethal fires to support friendly operations in the urban environment.[68]

As this chapter highlights, a significant amount of FMV and imagery capability has been provided by fighter aircraft using targeting and reconnaissance pods to the Joint Force Commander. However, as mentioned previously, there is little to no mention of targeting pods, tactical reconnaissance, or nontraditional ISR in any of the official USAF documents, such as, *The Air Force Handbook* or *Air Force Fact Sheets*. The services and the joint community continue to struggle with how to define these evolving mission performed by these high-tech platforms. The next chapter discusses this issue.

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[66] Richard Burgess, "Dual Role Strike Fighters Bring Their Own Surveillance to the Battle.
[67] Adam Hebert, "Army Change, Air Force Change," 38.
[68] Land Sea Application Center, *MTTP For Aviation Urban Operations* II-13-15.

Chapter 4

Joint Definitions Related to FMV

"The misuse of language induces evil in the soul."

-- Socrates

As shown in the preceding two chapters, several terms have been used in military service documents and in recent operations to define the mission being performed by airborne, armed FMV assets. This chapter is an analysis of the applicability of those terms to the actual missions being performed.

Current Definitions Related to Airborne, Armed Full Motion Video Capabilities

Air Support. All forms of support given by air forces on land or sea.[69]

While this certainly encompasses all aspects of airborne, armed FMV capabilities which have been described previously, the term, air support, is much too broad for any meaningful use or discussion regarding FMV capabilities.

[69] Joint Chiefs of Staff, *Joint Publication 1-02, Department of Defense Dictionary of Military and Associated Terms* (Washington DC: Joint Chiefs of Staff, 12 April 2001, as Amended Through 5 Jan 2007), 28.

Close Air Support (CAS). Air action by fixed and rotary-wing aircraft against hostile targets that are in close proximity to friendly forces and that require detailed integration of each air mission with the fire and movement of those forces.[70]

This term is often used when describing the mission conducted by manned, fixed wing FMV assets in OIF/OEF. Due to sensitivities among the services regarding terminal attack control, this term is almost never used in reference to unmanned assets. Also, using the term CAS is limiting because the task may be to observe something deep in enemy territory or even in friendly territory, but not in close proximity of friendly forces. Furthermore, CAS is typically used for employment of air, not a non-lethal task such as providing some type of persistent over-watch of an enemy location. Even if the aircraft were operating in close proximity of friendly forces, if no ordnance will be expended, detailed integration with fires and movement of those forces is not required.

Armed Reconnaissance. A mission with the primary purpose of locating and attacking targets of opportunity, i.e., enemy materiel, personnel, and facilities, in assigned general areas or along assigned ground communications routes, and not for the purpose of attacking specific briefed targets.[71]

Though this term is quite often used in OIF/OEF air support requests for manned air support, the term armed reconnaissance is inaccurate for the mission at hand. First, this definition states attacking targets of opportunity with kinetic effects is a primary purpose. However, this happens infrequently during OIF/OEF missions since most missions have a specific set of targets/items of interest and most do not result in weapons employment.

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[70] Ibid., 91.
[71] Ibid., 45.

In fact, from September to December 2006 the 332nd Air Expeditionary Wing, Balad Air Base, Iraq, flew over 2500 fighter sorties and 45 of these sorties resulted in munitions expenditures. This is an expenditure rate of less than 1.8% for that time period.[72]

This definition also clearly implies the "target" may be from a list of target types, i.e. enemy personnel located in the rear area along a certain road. Typically the mission will be to go to a certain location, at a certain time, and look for a specific signature. If the strike criteria are met, the crew may attack it. If not, the crew contacts the responsible ground commander for clearance to attack the target or get further guidance. Also, this implies looking for something specific for a defined period of time. Again, this is much different than what is requested in OIF and OEF today. It is true that a specific target may not be given (i.e. attack the control van of the surface-to-air missile site), but most air missions have a specific named operation they are supporting and at least potential target sets. Also, there is little to no attacking of targets of opportunity given the collateral damage concerns and proximity of friendly and noncombatant forces.

Target Acquisition. The detection, identification, and location of a target in sufficient detail to permit the effective employment of weapons.[73]

This term has been increasingly used in USAF documents to describe the mission of systems, such as the MQ-1[74]. However, this term only captures certain aspects of the armed, FMV assets. While it does describe to a certain extent the collection of target

[72] Captain Angelina Maguinness, interview by author, 4 Mar 2007, Norfolk, VA. Captain Maguinness served as the Intelligence Weapons Officer with the 332 AEW, Balad Air Base, Iraq from Sep 2006 - Jan 2007.

[73] Joint Chiefs of Staff, *Joint Publication 1-02,* 529.

[74] United States Air Force, *U.S. Air Force Fact Sheet MQ-1 Predator Unmanned Aerial Vehicle.*

information, it does not convey the persistent nature of the mission and implies the hand off to another platform for weapons employment.

Reconnaissance. A mission undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an enemy or potential enemy, or to secure data concerning the meteorological, hydrographic, or geographic characteristics of a particular area.[75]

This conveys a means of collection on the enemy and/or environment, but does not convey the persistent nature of the task nor does this term indicate a capability to strike as required.

Air Reconnaissance. The acquisition of information by employing visual observation and/or sensors in air vehicles.[76]

This is more specific than the generic term, reconnaissance, but has the same basic limitations and again does not indicate a capability to strike as required.

Surveillance. The systematic observation of aerospace, surface, or subsurface areas, places, persons, or things, by visual, aural, electronic, photographic, or other means.[77]

This conveys a means of collection as well as implies some bit of persistence, but does not fully capture the dwell necessary to achieve the desired effect nor does it refer to the potential requirement to strike the target if required.

Air Surveillance. The systematic observation of airspace by electronic, visual or other means, primarily for the purpose of identifying and determining the

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[75] Ibid., 446.
[76] Ibid., 25.
[77] Ibid., 518.

movements of aircraft and missiles, friendly and enemy, in the airspace under observation.[78]

This clarifies the airborne nature of the task, but limits the observation to primarily aircraft and missiles. It does not fully capture the dwell necessary to achieve the desired effect nor does it refer to the potential requirement to strike the target if required.

Intelligence. 1. The product resulting from the collection, processing, integration, analysis, evaluation, and interpretation of available information concerning foreign countries or areas. 2. Information and knowledge about an adversary obtained through observation, investigation, analysis, or understanding.[79]

Intelligence typically refers to the finished end product resulting from some collection of information not necessarily the act of gathering the information.

Intelligence, Surveillance, and Reconnaissance. An activity that synchronizes and integrates the planning and operation of sensors, assets, and processing, exploitation, and dissemination systems in direct support of current and future operations. This is an integrated intelligence and operations function.[80]

The most important aspect of this definition is the integration of intelligence and operations. Unfortunately, this is not widely known or accepted, especially in the operational community. Thus, ISR has a stigma that it only concerns intelligence personnel. Also, this does not fully capture the dwell necessary to achieve the desired effect nor does it refer to the potential requirement to attack the target if required.

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[78] Ibid., 29.
[79] Ibid., 264.
[80] Ibid., 267.

Battlespace Awareness. Knowledge and understanding of the operational area's environment, factors, and conditions, to include the status of friendly and adversary forces, neutrals and noncombatants, weather and terrain, that enables timely, relevant, comprehensive, and accurate assessments, in order to successfully apply combat power, protect the force, and/or complete the mission.[81]

This term is used more and more, but from the definition, it is meant to refer to a higher level of knowledge and understanding of the operational environment those results from the collection and analysis of much information on many different things, not just the enemy. This also does not convey the need to prosecute the target as required.

Persistent Surveillance — A collection strategy that emphasizes the ability of some collection systems to linger on demand in an area to detect, locate, characterize, identify, track, target, and possibly provide BDA and re-targeting in near or real-time. Persistent surveillance facilitates the formulation and execution of preemptive activities to deter or forestall anticipated adversary courses of action.[82]

By its name and definition, this term captures the nature of the issue. However, it falls short of acting on the information gathered and only facilitates further action.

Forward Air Controller (Airborne) — A specifically trained and qualified aviation officer who exercises control from the air of aircraft engaged in close air support of ground troops. The forward air controller (airborne) is normally an airborne extension of the tactical air control party. Also called FAC(A).[83]

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[81] Ibid., 65.
[82] Ibid., 406.
[83] Ibid., 213.

This term describes the control and coordination aspect as it relates to support to ground forces, but does not detail the persistent collection aspects nor the organic employment of weapons.

Tactical Air Coordinator (Airborne) — An officer who coordinates, from an aircraft, the actions of other aircraft engaged in air support of ground or sea forces. Also called TAC(A).[84]

Use of the term TAC(A) has the same limitations as the use of FAC(A).

There are two other terms which have used in conjunction with FMV assets. Neither of them has approved joint definitions. These terms are Nontraditional ISR (NTISR) and Strike Coordination and Reconnaissance (SCAR). NTISR refers to the limited use of fighter aircraft with targeting pods to fill gaps in meeting FMV requirements. In OIF today, this is always a secondary tasking not to interfere with higher priority tasking. In practice, preplanned NTISR is rarely accomplished and dynamic NTISR is done unsystematically without a prioritized, integrated collection strategy. SCAR is used primarily in USAF channels and describes working with other platforms, but does not describe the persistent nature of the mission or the organic employment of weapons.[85]

As demonstrated above, none of the current approved joint terms nor any other currently used term accurately define the FMV capability and the missions it supports. This causes much friction and confusion, especially when attempting to integrate platforms across traditional operations and intelligence lines of operation. In Chapter 7, a

[84] Ibid., 524.

[85] NTISR and SCAR are not joint terms, however they can be found in some Air Force documentation. Also, the Air Land Sea Application Center is contemplating the production of an NTISR MTTP.

new term, persistent armed surveillance, is recommended for use. The next chapter discusses our current processes for achieving this integration.

Chapter 5

Tasking Process

Our satellites and platforms that collect ISR data had difficulty in a real-time, emerging target situation like we had in Kosovo. It's not that we can't do it, it's that we don't practice it…no target ever died in the collection process…we don't pop the cork when the picture arrives; we pop the cork when the target is dead.

General John Jumper, Commander, United States Air Force Europe, 1999[86]

While FMV capabilities have been used in all of our major operations in the last twenty years and video technology has exploded to provide huge capabilities down to the lowest tactical level, the processes and procedures to maximize these capabilities have lagged behind as the above quote demonstrates. This chapter will summarize the two critical planning and execution processes for the majority of FMV assets. These processes are the Joint Air Operations Planning/Execution processes and the Joint ISR collection planning/execution processes. This chapter highlights the parallel nature of these tasking processes and how little they are integrated, especially in regard to FMV ISR requirements and strike requirements.

[86] Joint Chiefs of Staff, *Joint Publication 2-01, Doctrine for Joint and National Intelligence Support to Military Operations* (Washington DC: Joint Chiefs of Staff, 7 October 2004), III-27.

Joint Air Operations Plan

Normally the Joint Force Commander (JFC) will designate a JFACC. One of the primary duties of the JFACC and his staff is to produce the Joint Air Operations Plan (JAOP). This is the JFACC's plan for integrating and coordinating joint air operations. This must be a collaborative effort of the JFACC staff, the JFC staff, and the other components' staffs to ensure the joint air effort will support the JFC's overall campaign plan. The key tasks within the JAOP are:

- Integration of joint air capabilities and forces

- Identification of objectives and tasks

- Identification of measures or indicators of success used to determine whether air operations are meeting assigned objectives

- Detail current and potential adversary offensive and defensive COAs

- Synchronization of the phasing of air operations with the JFC's plan

- Development of specific procedures for allocating, tasking, exercising, and transitioning C2 of joint air capabilities and forces[87]

Joint Air Operations Targeting

Due to the criticality of the targeting process and the limited number of strike assets, the targeting process is one of the JFC's most rigorous processes. Targeting is the "process of selecting and prioritizing targets and matching the appropriate response to them, taking account of operational requirements and capabilities."[88] This is a very

[87] Joint Chiefs of Staff, *Joint Publication 3-30, Command and Control for Joint Air Operations,* (Washington DC: Joint Chiefs of Staff, 5 June 2003, III-15.

[88] Ibid., 16.

complicated process. Targeting by different forces or echelons within the same force must be deconflicted and strikes by other components must be integrated. Normally the JFC designates a joint targeting coordination board (JTCB) to accomplish the broad targeting oversight and integration functions. To further enhance synchronization and integration, the JTCB provides a forum where all components can articulate strategies and priorities. The JTCB will refine the draft Joint Integrated Prioritized Target List (JIPTL) for JFC approval. Also, all components should provide the JFACC with their air plan to minimize the risk of fratricide, assure deconfliction, avoid duplication, and to provide visibility to all other friendly forces.[89]

If the JFC delegates his joint targeting coordination authority to the JFACC, the JFACC staff will collect all target nominations and prioritize them into the draft JIPTL. The JFACC may recommend other component assets for use against JIPTL targets. However, only the JFC can approve the use of other components' assets or forces.[90]

The Joint Air Tasking Cycle

The joint air tasking cycle provides for the efficient and effective employment of joint air capabilities and forces. This process facilitates the planning, coordination, allocation, and tasking of joint air missions in adherence with JFC guidance. The JFACC process must accommodate changes in JFC guidance, the fluidity of the operational environment and situation, and additional requests from other component commanders. This process is designed to focus targeting efforts on operational requirements in a systematic analytical approach.[91]

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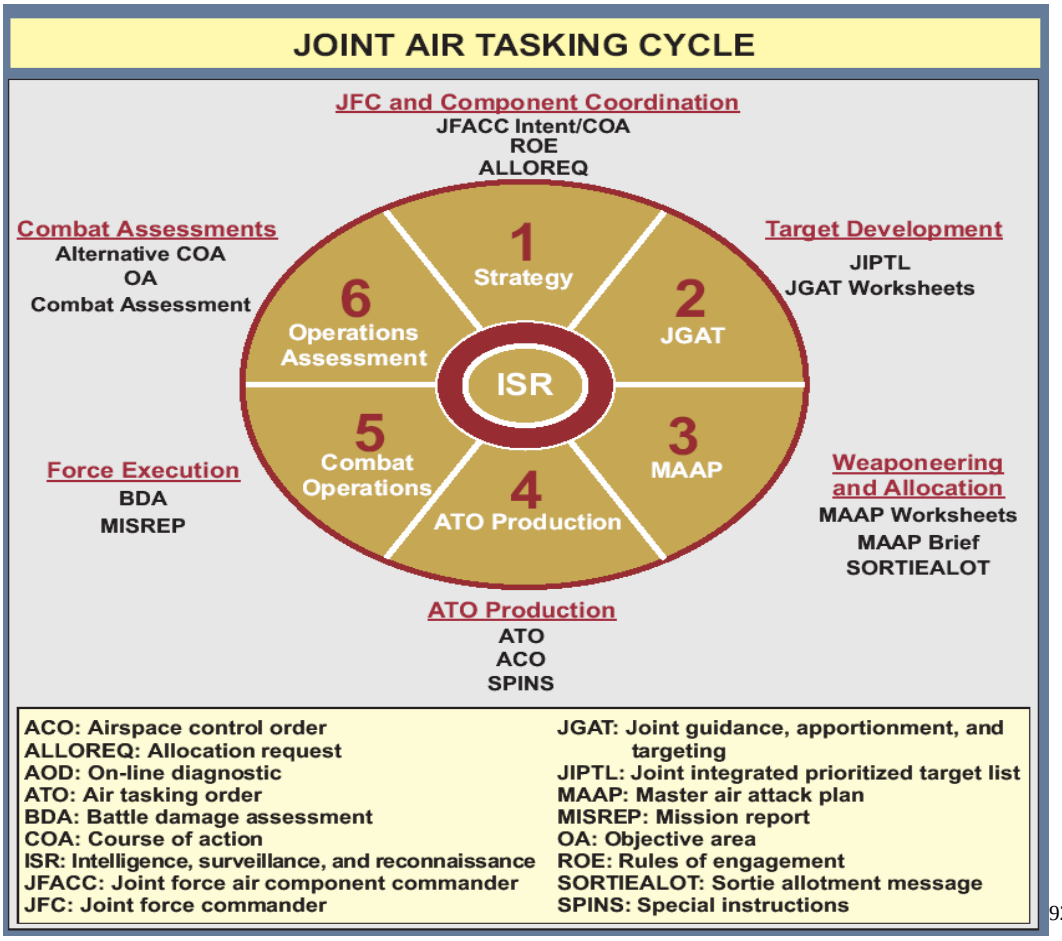
[89] Ibid., 17.
[90] Ibid., 19.
[91] Ibid., III-19-20.



[92]

Figure 1. Joint Air Tasking Cycle

Close Air Support Requests

Today's operating environment has put an emphasis on close air support. When CAS requirements are identified, CAS planners submit a preplanned air support request as specified by higher headquarters guidance. When situations develop inside the ATO planning cycle, immediate air support requests are submitted.[93]

[92] Ibid., 23.

[93] Joint Chiefs of Staff, *Joint Publication 3-09.3, Joint Tactics, Techniques, and Procedures for Close Air Support (CAS)* (Washington DC: Joint Chiefs of Staff, 3 September 2003 incorporating change 1, 2 September 2005), III-25-27.

Theater Collection Management

Requests for intelligence are supported by the theater collection management process. This collection management process, which occurs at all levels of intelligence, converts validated intelligence requirements into collection requirements, tasks and coordinates with the various collection agencies, monitors results, and retasks as required. One of the greatest collection management challenges is to maximize the effectiveness of limited collection resources within the time constraints imposed by operational requirements.[94]

The theater J-2 retains full management authority over all intelligence collection requirements within the combatant command's area of responsibility. Also, management and validation of collection requirements for a theater resides at the combatant command unless delegated.[95]

At the JFC's discretion, a joint collection management board (JCMB) may be formed to manage collection requirements and coordinate collection operations with the components. This JCMB should be co-chaired by the J-2 and J-3 and include component representatives. The JCMB receives collection nominations, validates and prioritizes requirements, develops the joint integrated prioritized collection list (JIPCL), and recommends the apportionment of organic ISR assets to meet JIPCL requirements.[96] In practice, the JCMB does not have the rigor of the JTCB.

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[94] Joint Chiefs of Staff, *Joint Publication 2-01, Doctrine for Joint and National Intelligence Support to Military Operations*, III-12.

[95] Ibid., III-15.

[96] Ibid.

Collections Planning

Collection planning is a continuous process that coordinates and integrates the efforts of collection agencies. The collection plan that is generated may be either a simple worksheet or a more formal document, depending on the complexity of the requirements. For efficient collection request management, it is important to create, continuously update, and monitor the JIPCL. After defining the requirement, the collection manager determines the availability and capability of collection assets and resources that might contribute to satisfaction of the requirement.[97]

The collection manager begins by considering the highest priority requirement, and then continues through the other active requirements to determine how each request can be satisfied. The resulting collection tasking provides specific guidance identifying the activity to undertake collection operations, the target to be covered, and the date-time to accomplish the mission, and the place and time to report the information.

A collection strategy is a systematic scheme to optimize the effective and efficient tasking of all collection assets and resources against requirements. Collection effectiveness is determined by analyzing the capability and availability of ISR resources to collect against specific targets. Collection efficiency is determined by comparing the appropriateness of ISR assets to collect against specific targets in a given operational environment.[98]

[97] Ibid., III-16.
[98] Ibid., III-21.

Asset redundancy places greater demands on the limited assets and resources available and has to be clearly justified by the potential intelligence gain. Collection strategies against high interest targets should emphasize and provide for the near-continuous, all weather, and day/night surveillance of the operational environment through the efficient utilization of all appropriate ISR assets in a persistent surveillance, as opposed to periodic reconnaissance, mode. Persistent surveillance is critical to countering the adversary's use of camouflage, concealment, and deception. Persistent surveillance is facilitated by the effective synchronization and integration of all theater and national ISR assets and resources in a coherent collection strategy. Because persistent surveillance depends heavily on resources which are in high demand and few in number, requirements for persistent surveillance must be prioritized.[99]

Collection Asset Mission Planning

Planning is concerned with the identification, scheduling, and controlling of collection assets and resources. The planner reviews mission requirements for sensor and target range, system responsiveness, timeliness, threat, weather, and reporting requirements. These requirements are translated into specific mission tasking orders. TCPED element managers must fully understand the requirements and mission profile. A mission tasking order goes to the unit selected to accomplish the collection operation. The selected unit makes the final choice of specific platforms, equipment, and personnel based on operational considerations, such as maintenance schedules, training, and experience. It is strongly recommended that collections operations management

[99] Ibid., III-24.

personnel are located in proximity to the operations staff elements responsible for reconnaissance assets. [100]

Collection Operations Management Execution

Based on the current operating environment and the overall ISR picture, the JFC and J-2/J-3 identify fleeting opportunities for intelligence collection or strike operations against time-sensitive targets that may warrant dynamic re-tasking of collection platforms. Additionally, time sensitive decision making, friendly force situational awareness, and combat identification efforts are directly enhanced by ISR tasking and support. At the request of, and in coordination with, the J-3 operations staff, the J-2 collection management staff forwards requests for dynamic re-tasking to the controlling authority of the most appropriate ISR asset. The collection operations manager controlling the ISR platform accomplishes the actual re-tasking of the collection asset.[101]

Intelligence, Surveillance, and Reconnaissance Concept of Operations

To facilitate the optimum utilization of all available ISR assets, an ISR CONOPS should be developed in conjunction with operational planning. The ISR CONOPS should be based on the collection strategy and should be developed jointly by the J-2 and J-3. It should address how ISR assets and their associated tasking, collection, processing, exploitation, and dissemination (TCPED) infrastructure, to include coalition and commercial assets, will be used to answer the intelligence requirements. This ISR CONOPS should also identify any ISR asset shortfalls relative to the JFC's validated

[100] Ibid., III-25.
[101] Ibid., III-28.

Prioritized Intelligence Requirements. A periodic evaluation of the capabilities and contributions of all available ISR assets, including a brief description of validated intelligence requirements and ISR force organization, allocations, employment priorities, and command and control (C2) relationships is required.[102] This evaluation should also include a general depiction of employed or planned employment of ISR assets to support daily joint and component-level operations.[103]

With the proliferation of FMV platforms, planners must pay close attention to their integration and deconfliction within the area of operations and ensure all units are informed of the plan.[104]

In summary, there are several key issues with these planning and execution processes. As detailed above, there are two distinct, almost separate joint processes for air operations planning and ISR planning. Each has different requirements management philosophies. Operations requirements are constrained. Intelligence requirements are unconstrained. Operational planners espouse fully integrated joint fires yet lower ground forces echelons won't fully integrate air platforms into their plan. They believe if an asset is not organic its support can not be guaranteed. Also, some at the tactical level perceive airpower as free and are not concerned with efficiency. In OIF/OEF today, the CFACC struggles to get feedback from the various supported commanders on the effectiveness of CFACC FMV capabilities.[105] This lack of efficiency was acceptable in the Cold War when the US Air Force had enough platforms to conduct either strike or

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[102] Ibid., III-8.
[103] Ibid., III-9.
[104] Land Sea Application Center, *MTTP For Aviation Urban Operations* II-4.
[105] Colonel Mark Morris, interview by author, 19 Jan 2007, Shaw Air Force Base, SC. Colonel Morris served as the United States Central Command Air Forces Director of Staff from 2005-2007.

ISR and the enemy was easy to find. In today's GWOT and current counterinsurgency operations this does not work since the enemy is very hard to find and assets are in very high demand. Also, the lines between operations and intelligence have blurred and it is imperative to improve these processes.

General Michael Hayden provided this insight:

> Now, look at the targets of today, whether it's some idiot in a cave in Waziristan or rather small WMD production facilities. They're easy to finish. They're just damn hard to find. Now we've made this psychic shift, finishing is easy, finding is hard, we'll do precision instead of mass. Now information becomes absolutely critical to our success as a service, and I'm really talking here about us, about we Airmen. We get it. And that's a hell of a burden on intel guys.[106]

"In the past, we have always relied on something associated with a time delay," says one USAF general. "A third party was always involved in distribution. Now, there's no intel geek involved in the processing."[107] While fighter aircraft are heavily integrated with tactical ground units through US Air Force Battlefield Airmen, this statement demonstrates the pervasive FMV integration struggle that exists at the operational level as US forces attempt to maximize the effectiveness of our ability to find the enemy. The next chapter provides recommendations on how we can change joint doctrine, terms, organizations, and processes concerning armed, FMV capable platforms to increase joint operational effectiveness and efficiency.

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[106] General Michael Hayden, "2 February 2006 Air Warfare Symposium Speech" [on-line]; available from http://www.afa.org/media/scripts/AWS06_Hayden.html; Internet; accessed 11 Nov 2006.

[107] Richard New, "The Little Predator That Could," *Air Force Magazine*, Mar 2002, 62.

Chapter 6

Recommendations

The DoD established several UAS Task Forces to review the use of some FMV platforms due to their perception that they are not being used as effectively as possible. Issues that are being examined include whether persistent surveillance is better performed by UAS or by assets like blimps or tethered balloons and whether the organization of UAS resources is too decentralized. Rather than addressing the specific mix of UAS in Iraq, the biggest problem is developing a coherent concept of operations for the drones, said US Air Force General Richard Myers. He also stated:

> It's not an issue of, do we have enough assets? It is, do we have the right concept of operations for the assets that we own? The answer is no, because they're all at different echelons. Nobody wants to give up their piece of it; nobody's charged with looking over all of them.[108]

The preceding chapters documented the historical utilization, capabilities, doctrinal, and procedural shortfalls regarding airborne, armed, FMV capabilities. This chapter provides recommendations for joint doctrine and TTP changes concerning armed, FMV capabilities. If enacted, these changes would improve operational effectiveness and efficiency, thus advancing joint planning and combat employment of these capabilities.

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[108] Joshua Kucera, "US Reassesses Use of UAVs in Urban Areas," *Jane's Defence Weekly*, 9 Mar 2005 [Magazine on-line]; available from http://www8.janes.com/Search/documentView.do?docId=/content1/janesdatamags/jdw/history/jdw2005/jdw10377.htm@current&pageSelected=allJanes&keyword=US%20reassesses%20use%20of%20UAVs&backPath=http://search.janes.com/Search&Prod_Name=JDW&; Internet; accessed on 11 Nov 2006.

These recommendations are not prioritized as they complement each other and should be incorporated in an integrated manner.

One important note is we must not lose sight of the fact that joint planning should be based on capabilities and effects, not platforms. One of the central themes of most of the published works on FMV is the manned versus unmanned argument. The unmanned attribute of UAS is neither a capability nor an effect. Full motion video should be the focus particularly when it comes to "tiger teams" and "task forces." By using capabilities-based planning, we can determine which mission areas are most appropriate for UAS and which ones are better suited for manned capabilities.[109] These changes could also address this issue.

Establish Joint FMV Planning Cells

First, we must expand on the UAS Task Forces mentioned above. The effort must be expanded beyond UAS to the heart of the issue which is the capability required. A joint FMV management cell should be established at each combatant command under the J2, but composed of J3, J6, interagency planners with close ties to component, service, and other planning cells. Why the J2? The J2 has more insight and stake into the end-to-end process and products. This cell does not need to be a separate cell, but could be a matrixed organization closely tied to current Joint Collection Management Boards. This would eliminate the need for additional manpower. A similar cell should exist with the components as well. These cells would be the cornerstone of support to the Secretary of

[109] United States Air Force, *USAF RPA and UAV Strategic Vision*, 6.

Defense and the combatant commander in their efforts to increase UAS effectiveness through improved joint collaboration.[110]

Link Intelligence and Operations Planning and Execution Systems

As described previously, one of the major impediments to successful planning and execution is the two distinct operations and intelligence planning and execution systems. A system, or at a minimum, a more robust interface must be created to fuse these systems. This new system could include processes for requesting and receiving FMV support, whether ISR or attack. One option is for requests for support from FMV to mimic requests for close air support. In this model, ground commanders would use existing channels to request support. Information from the FMV platform could then be downlinked directly to the ground commander. This process could be coordinated through the unit's Battlefield Airmen who are in direct contact with the aircrew.[111] This system would also require an interface to current collection management applications, such as Photo Reconnaissance Intelligence Strike Mode (PRISM) to support collection plan development, ATO production, and the intelligence aspects of combat assessment. Figure 2 is a graphical depiction of the process described above.

[110] Office of the Secretary of Defense, *Unmanned Aircraft Systems (UAS) Roadmap, 2005-203* (Washington DC: Office of the Secretary of Defense, 4 Aug 2005), i-ii.

[111] United States Air Force, *USAF RPA and UAV Strategic Vision*, 7-27.

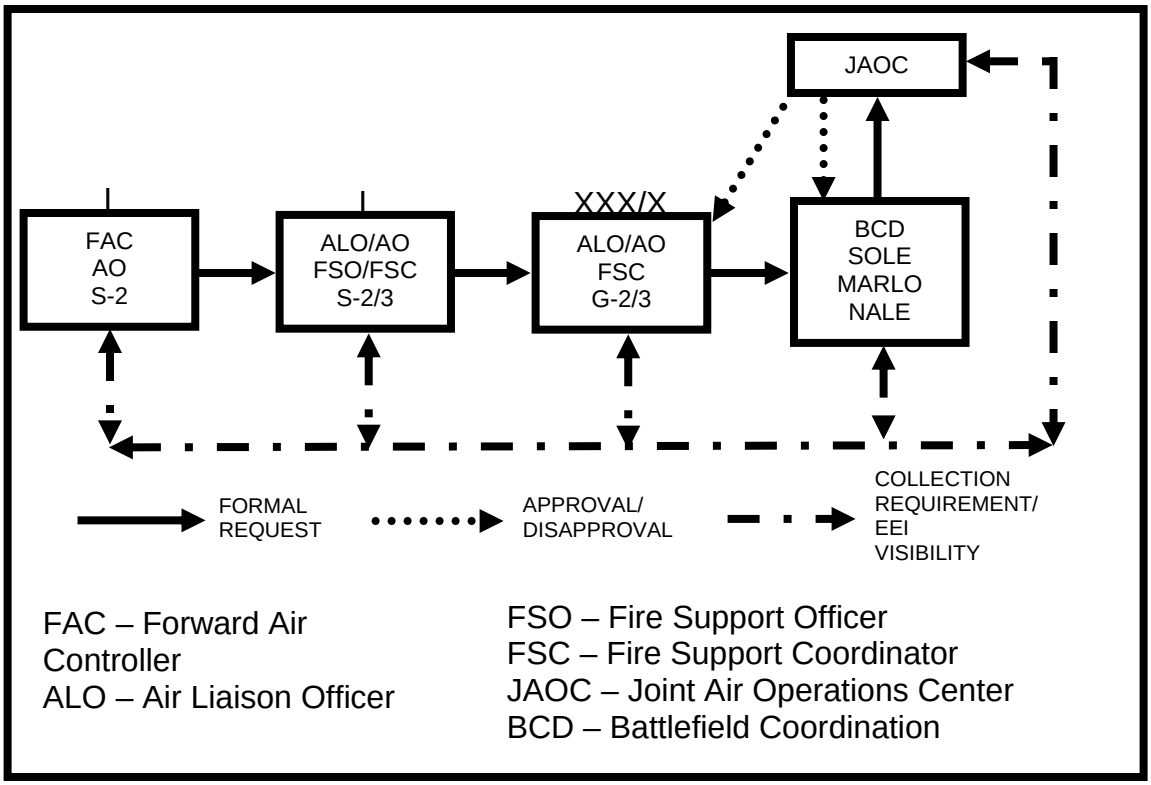

Figure 2. Linked Operations/Intelligence Planning System

Make Collection Planning and Execution Processes Just As Rigorous As the Targeting Process

As was highlighted in the previous chapter, the collection planning and execution process is not as rigorous as the targeting process. Targeting was the cornerstone of the operations and intelligence interface of the Cold War. Given the difficulty in finding, fixing, and tracking today's adversary, collections and analysis need to be the cornerstone for GWOT ISR operations. We need a cultural shift to "operationalize" intelligence, as opposed to treating it purely as a staff function, which was the approach taken during the Cold War when the United States had a more static adversary. In today's wars, intelligence collection can require conducting operations and intelligence specialists need to be active participants to ensure success. In the past, intelligence staff personnel crafted

estimates for military planners and that was the extent of the integration. According to Lieutenant General William Boykin, US Army:

> When you are operationalized, you are now part of that plan. We need to recognize they are running intelligence operations. They are not doing intelligence as a staff function. They are doing it as operations so they can find the enemy, know who he is, know what his intentions are [and] know how he is supported."[112]

Intelligence collection planning and execution, especially regarding FMV, is at the heart of this effort.

Add Persistent Armed Surveillance to the Joint Lexicon

In Chapter 5, several terms were deficient in defining the FMV mission. A new term Persistent Armed Surveillance better describes the mission. A proposed definition is:

> The unremitting, systemic observation of potential targets (places, persons, or things) by visual, electronic, photographic, or other means and attacking these targets when pre-approved criteria are meet or proper clearance by the authoritative C2 entity is granted. This is an integrated intelligence and operations function. If friendly forces are in close proximity, the mission can quickly transition to a close air support mission. This can be accomplished by one platform or a strategy to use a variety of platforms based on their unique capabilities.

This term captures the type of collection, mission duration, and weaponized nature of the mission. The definition describes the types of targets, potential sensors, collection strategy, and basic command and control for strike operations. Also, it differentiates the boundaries between this mission and CAS which is a continual friction point in today's operations. Finally, the definition clearly requires the integration of operations and intelligence.

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[112] Keith Costa, "Cultural Shift Under Way As Pentagon Revamps Defense Intelligence," *Inside the Pentagon*, 31 Aug 2006 [on-line]; available from http://www.insidedefense.com/secure/defense_docnum.asp?f=defense_2002.ask&docnum=PENTAGON-22-35-1; Internet; accessed on 11 Nov 2006, 1-4.

Update Associated Joint Doctrine and Training

Obviously, none of the above recommendations solve the issues described in this paper unless they are incorporated in joint doctrine, TTPs, training, and exercises and ultimately during operational execution. Within joint doctrine and TTPs, we must embrace the above concepts and strive for full integration regarding FMV platforms. During training and exercises, DoD must find more opportunities to train on and exercise the FMV end-to-end processes. Exercises such as Atlantic Strike are a good beginning, but must go farther.[113]

With these changes, enormous strides can be made in finding, fixing, and finishing our adversary in GWOT today and any adversary during a future contingency. In summary, the following recommendations should be adopted regarding airborne, armed FMV capabilities:

1. Establish Joint FMV Planning Cells
2. Link Intelligence and Operations Planning and Execution Systems
3. Make Collection Planning and Execution Processes Just As Rigorous As the Targeting Process
4. Add Persistent Armed Surveillance to the Joint Lexicon
5. Update Associated Joint Doctrine and Training

As General William Hobbins, commander of the United States Air Forces in Europe stated:

> Integration must go beyond airspace. It's got to go to the core of operations. This would correspond to improve situational awareness at all

[113] Tiffany Payette, "Atlantic Strike III Provides Realistic Deployment Training," *Air Force Print News Today*, 31 Mar 2006 [on-line]; available from http://www.af.mil/news/story_print.asp?id=123018330; Internet; accessed 6 Mar 2007.

> levels of warfare. It's about decision superiority. We should be capable of flying both manned and unmanned platforms together, to include multiple unmanned airframes controlled by one operator. And we need commanders to have the confidence that unmanned or manned, it doesn't make a difference as they are equally effective.[114]

These changes have the potential to significantly improve the combatant commanders' ability to conduct joint planning and combat employment of airborne, armed FMV capabilities with greater operational effectiveness and efficiency.

[114] Elizabeth Culbertson, "COMUSAFE: Unmanned Aircraft Key To Future Decision Superiority," *Air Force Print News Today*, 19 Oct 2006 [on-line]; available from http://www.af.mil/news/story.asp ?storyID=123029520; Internet; accessed 10 Nov 2006.

Chapter 7

Conclusions

"What we do have to do is get everybody under the same roof, talking the same language, organizing ourselves toward a single purpose, and stop worrying about ownership issues."

General John Jumper, USAF[115]

The purpose of this research paper was to assemble key information regarding the historical use, key terms, tasking process, and capabilities related to our nation's airborne armed FMV assets. The chapter on history documented the ever increasing use of FMV in past military operations from Vietnam to today's combat operations in OEF and OIF. Next, the varied capabilities of several FMV assets, both manned and unmanned, including the AC-130 Spectre/Spooky, P-3AIP Orion, various fighter aircraft equipped with targeting pods, MQ-1 Predator, RQ-5 Hunter, and MQ-9 Reaper were highlighted. Next, an analysis of several applicable joint and service definitions related to FMV was conducted and highlighted the associated problems with the use of these terms. Following this, a summary and analysis of the key processes associated with FMV was conducted. These processes included joint ISR collection planning and execution, joint air operations planning and execution, operations and intelligence airpower requirements

[115] Robert Dudney, "Where Do UAVs Go From Here?" *Air Force Magazine*, Jul 2005, 2.

management, and the impact of each of these on FMV planning at the strategic/operational level. Finally, the following recommendations were presented:

1. Establish Joint FMV Planning Cells
2. Link Intelligence and Operations Planning and Execution Systems
3. Make Collection Planning and Execution Processes Just As Rigorous As the Targeting Process
4. Add Persistent Armed Surveillance to the Joint Lexicon
5. Update Associated Joint Doctrine and Training

If the DoD does not implement these recommendations, FMV capabilities will continue to operate in a less than optimal manner and their effectiveness in joint operations will be degraded. If however, the DoD fully adopts the recommendations above, a new era for FMV use is possible. This new approach will revitalize operations and intelligence integration and will significantly improve the combatant commanders' ability to conduct joint planning and combat employment of these capabilities. From this, a greater operational effectiveness and efficiency of airborne armed FMV assets will occur and their use in the Global War on Terrorism will be maximized.

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Vita

Lieutenant Colonel Mark A. Cooter graduated from East Tennessee State University in 1985 with a Bachelor of Science in Mathematics and was commissioned through the Air Force Officer Training School. He also holds a Master of Science in Computer Resources and Information Management, from Webster University and is a graduate of Squadron Officer School, Air Command and Staff College, Air War College, and the US Air Force Weapons School.

He has served as a squadron intelligence officer, flight commander, operations officer, squadron commander, and deputy group commander. Lieutenant Colonel Cooter has led and supported combat operations during Operations DESERT STORM, ALLIED FORCE, ENDURING FREEDOM, and IRAQI FREEDOM. He has twice been named the Air Combat Command Intelligence Officer of the Year. He has also served as a staff officer at Headquarters Air Intelligence Agency, Central Command Air Forces and Headquarters United States Air Force. Prior to assuming his current position, Lieutenant Colonel Cooter served as Deputy Commander, 609th Air Intelligence Group and Deputy A2 Central Command Air Forces, Shaw AFB, SC.

Some of his decorations include the National Intelligence Distinguished Service Medal, Air Force Meritorious Service Medal with eight devices, Aerial Achievement Medal, Air Force Commendation Medal with one device, and Air Force Achievement Medal.

Lieutenant Colonel Cooter is married to Captain Angelina Maguinness. He has two children, Brittany and Jaclyn.